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JULY 5, 1952

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Ornate Horned Frog

See Page 9

A SCIENCE SERVICE PUBLICATION

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In quest of the "skeleton of speech"

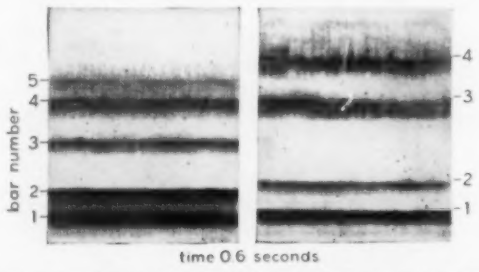
In the famous Quiet Room at Bell Laboratories, this young volunteer records speech for analysis. Scientists seek to isolate the frequencies and intensities which give meaning to words . . . stripping away non-essential parts of word sounds to get the basic "skeleton" of speech.

A child or an adult . . . a man or a woman . . . an American or an Englishman – all speak a certain word. Their voices differ greatly. Yet listeners understand the word at once. What are the common factors in speech which convey this information to the hearer's brain?

Bell scientists are searching for the key. Once discovered, it could lead to new electrical systems obedient in new ways to the spoken word, saving time and money in telephony.

Chief tool in the research is the sound spectrograph which Bell Telephone Laboratories developed to make speech visible. Many kinds of persons record their voices, each trying to duplicate an electrically produced "model" sound. While their voice patterns are studied, a parallel investigation is made of the way human vocal cords, mouth, nose and throat produce speech.

Thus, scientists at Bell Laboratories dig deeply into the fundamentals of the way people talk, so that tomorrow's telephone system may carry your voice still more efficiently – offering more value, keeping the cost low.



Spectrograms of young girl's voice (right) and man's voice making "uh" sound as in "up." Horizontal bars reveal frequencies in the vocal cavities at which energy is concentrated. The top of the picture is 6000 cycles per second. Pictures show how child's resonance bars are pitched higher than man's.

BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields.

ASTRONOMY

Photograph Unborn Stars

Tiny black spots on photographs, easily mistaken for film imperfections, are dense clouds of cosmic dust believed to be contracting into young stars.

➤ STARS YET to be born have been photographed. Not advanced enough to shine forth in the heavens, they show up as dark, roundish spots against a background of bright stars or glowing nebulae.

Dozens of these tiny black spots, which might easily be mistaken for imperfections in the film, show up in photographs of the Great Nebula near Eta Carinae in the constellation of Carina, the ship's keel.

SNL cover, Feb. 23, shows this birthplace of the stars, at that time unannounced.

Pictures of them were taken by Dr. Bart J. Bok, associate director of Harvard College Observatory, and by the staff of the Boyden Station during Dr. Bok's 18-month stay in South Africa.

"These dark globules are dense clouds of cosmic dust," Dr. Bok told SCIENCE SERVICE. "They were created out of material filling the space between the stars and are believed to be contracting into young stars. Millions of years from now they may shine forth in the southern sky."

A wide-eyed telescope owned jointly by Armagh Observatory of Northern Ireland, Dunsink Observatory of Eire and Harvard Observatory was used for these photographs. The only one of its kind in the southern hemisphere where the Milky Way is best seen, it is a modified Schmidt telescope designed by Dr. James G. Baker of Harvard Observatory. The telescope was constructed by the Perkin-Elmer Corp. at Norwalk, Conn., with Dr. Baker as principal consultant. A picture of this telescope appeared in SNL, Feb. 23, p. 115.

The telescope was put into operation near Bloemfontein, South Africa, about a year and a half ago. It gives exceptionally clear pictures of a large area of sky. Already it is furnishing fresh information concerning the possibility that stars are continually being created by condensation of vast cosmic "dust clouds" in interstellar space.

"These tiny dark globules are seen projected against almost all of the larger luminous nebulae surrounding blue-white supergiants," Dr. Bok pointed out. "They and the shining nebulae which serve as background to make them visible are particularly numerous in the Carina constellation. A total of 65 of these embryo stars have been found near the Eta Carina Nebula."

The process of star formation is believed to have progressed farther in these small, dark, round nebulae than in any other heavenly object as yet observed. Most of them are quite small, cosmically speaking. Their diameters range from 5,000 to 30,000 times the distance separating the earth and the sun. Yet they are so light their mass is estimated to be only somewhere between one-tenth and one-hundredth that of the sun.

Some day gravity, assisted by the outside pressure of radiation from the surrounding stars, will pack the material forming these globules so close together they will become heated and begin to shine from the stellar fire thus started. Dr. Fred L. Whipple of Harvard Observatory and Dr. Lyman Spitzer of Princeton University Observatory have demonstrated theoretically that in time these globules should become luminous stars.

These embryo stars all belong to our own Milky Way system. They seem to be especially prevalent in the Eta Carina Nebula, which really is a luminous knot in one of the spiral arms of our Milky Way galaxy, Dr. Bok recently showed.

Some of these dark nebulae, now called globules, were noted by the late Dr. E. E. Barnard of Lick and Yerkes Observatories. Although he made a list of them, however, little attention has been paid them until recently.

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VETERINARY MEDICINE

Combination Vaccine Halts Dog Hepatitis and Distemper

➤ LASTING PROTECTION against the two most serious infectious diseases of dogs, distemper and infectious hepatitis, can be had from a "combination vaccine" announced by Drs. James A. Baker, George C. Poppensiek and James H. Gillespie of Cornell Research Laboratory for Diseases of Dogs, Ithaca, N. Y., at the meeting of the American Veterinary Medical Association in Atlantic City, N. J.

Infectious hepatitis is a liver and kidney ailment that kills 10% of animals getting it and permanently injures those that recover. About half the present dog population has had the disease at one time or another.

A vaccine for lasting immunity to distemper has been available for some years but this is the first time a vaccine against infectious hepatitis has been combined with the distemper vaccine. Supplies of the double vaccine are expected to be available to veterinarians later this year.

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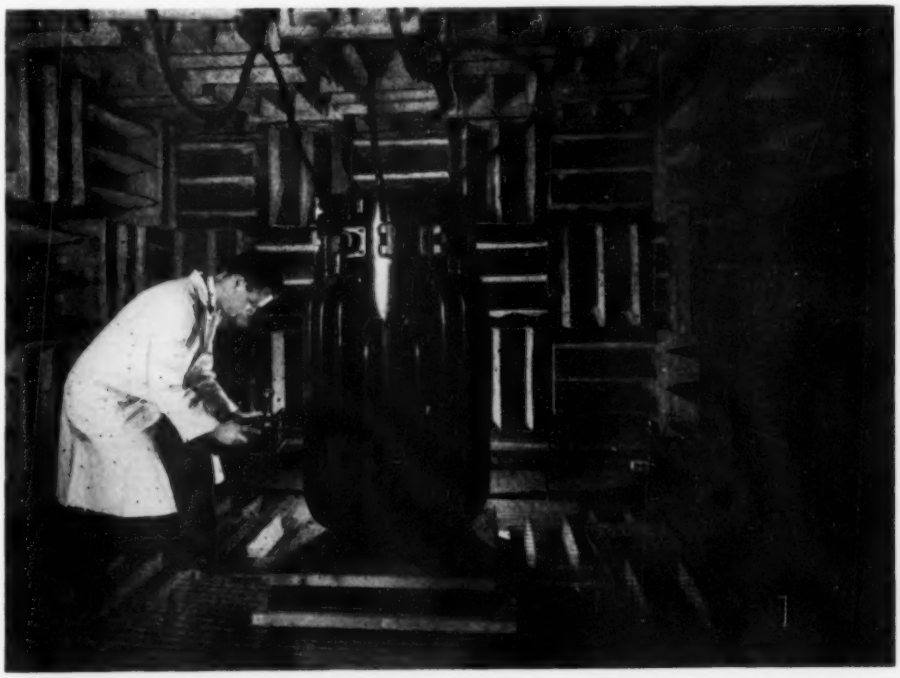

ANECHOIC LABORATORY—Quieter fluorescent lights, transformers and other electrical equipment are expected to result from studies now being made in this specially designed room, center of operations in the new Westinghouse acoustics laboratory. Charles H. Smith, engineer, is measuring the slight hum of a transformer.

AERONAUTICS

Stall-Warning Devices

➤ THE NEED for stall-warning devices on light planes such as used in private flying is emphasized again by the National Advisory Committee for Aeronautics in a report which summarizes the devices now available.

Stall in aviation is a term in general use to indicate the condition that occurs when a plane becomes uncontrollable due to lack of speed or headway. Every plane has a certain flying speed at which the lift is sufficient to keep it safely along its path.

In rising to higher altitudes or dropping for a landing, its angle of attack, the angle between the chord of the plane and the relative wind, is apt to become such tha the plane loses its lift. More accidents of private planes occurred from stalling than from any other cause up until the last quar ter of 1951 when stall-spin accidents decreased.

The report, prepared at the NACA Aeronautical Laboratory, Langley Field, Va., by John A. Zalovcik, discusses a variety o stall-warning devices now available. Th purpose of the paper is to describe the prin ciples involved in several types of specia stall-sensing devices and angle-of-attack sensing devices and point out some condi tions under which difficulty may be experi enced.

Stall-sensing devices usually operate on flow characteristics associated with the move ment of the stagnation point or with flow separation on the wing. Those based on the movement of the stagnation point make use of the large change in pressure or the 180-degree change in flow direction as the stagnation point moves past a given position on the leading edge of the wing.

An angle-of-attack-sensing device meas ures the angle of local flow relative to an arbitrary reference line. An instrument of this type may consist of a vane pivoted in such a way as to align itself with the local flow.

Both sensing devices must have means of transmitting the warning to the pilot. These may be based on sight, hearing or feel. The "feel" method sets up vibrations in a rudder-pedal shaker or a stick shaker which the pilot can distinguish from ordinary airplane vibrations.

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MEDICINE

Bronchial Tubes Cleansed by Aerosol

➤ GOOD RESULTS with aerosol cleansing of bronchial tubes in patients with lung and bronchial diseases, including tuberculosis, are reported by Drs. Carl R. Limber, Howard G. Reiser, L. Chandler Roettig and George M. Curtis of Ohio State University, Columbus, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 28).

The aerosol, which the patients breathe through a nasal mask, contains trypsin. This is an enzyme, or ferment, which digests protein. When breathed into the bronchial tubes, it digests the thick sputum and mucus sufficiently so that patients can cough it up easily.

For a few hours after a treatment, patients cough more, but it is not the hard, dry, racking cough that formerly tired them. Then after this period of increased but easier coughing, they do not cough for a few hours, probably because all the material has been "flushed" out of the bronchial tubes. Patients sleep better, their appetites improve and they gain weight.

In a few cases, patients with tuberculosis had negative sputums for several weeks after the bronchial cleansing treatment. The Ohio State doctors do not have any evidence yet that the treatment interferes with the growth of the tuberculosis germs. Sputums became positive again. But the cleansing results in a more normal state in the bronchial tubes which presumably is helpful.

The Ohio State doctors have given a total of 251 treatments to 33 patients with tuberculosis, bronchiectasis, atelectasis, pneumonia, pneumonitis and bronchitis.

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Question Box

ASTRONOMY

What planets other than earth have been found to have hydrogen in their atmospheres? p. 6.

How many eclipsing stars have been spotted beyond our own galaxy? p. 13.

ENGINEERING

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What is Interlingua? p. 10.

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What may cause horses to go lame? p. 7.

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What country has more rabies than probably any other in the world? p. 13

Photographs: Cover, New York Zoological Society; p. 3, Westinghouse Electric Corporation; p. 5, United States Line Company; p. 7, Westinghouse Air Brake Company.

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PSYCHOLOGY

Soviet Man Unnatural

Communist system keeps going because of occasional "backsliding" of minor officials, confidential interviews with Russian refugees show.

➤ THE RUSSIAN Communists are able to keep on putting the Soviet system over on the Russian people chiefly because every once in a while the minor official forgets he is a Communist and, in spite of himself and the spies who watch him, "backslides" into brotherly, affectionate and easy-going human relations.

This conclusion is based on confidential interviews with 29 young Russians only recently come to this country, ranging in social class from collective farm peasants to professional men, half of whom had been Communists. The interviewing was done by Dr. Henry V. Dicks for the RAND Corporation and the Russian Research Center, Harvard University. It is reported to the Research Center for Group Dynamics, Ann Arbor, Mich., and to the Tavistock Institute of Human Relations, London.

By long training, the Russians have been taught that the people are not to be trusted and they believe that a "strong government" is needed to keep the "masses" in line. This confidence is especially strong among those who have not lost the illusion that this power comes from the people. They say of the M.V.D. (secret police) that "after all they are our own boys who see to it that people behave themselves."

To the Russian who has feared the secret police since the days of Ivan the Terrible, the terror is just an accepted part of life.

What makes it possible to tolerate the hard bosses is that every once in a while the officious, stupid factory manager is publicly degraded and punished. Thus he is made the scapegoat for the whole Soviet system.

The Russian nature is in complete contrast to that of the Soviet Man, as determined by the Communist Party line, Dr. Dicks found. The Russian is a spontaneous, generous, affectionate companion, fond of talk, good food and of bouts of drinking vodka to the accompaniment of rears of singing and laughter, back-slapping and general good fellowship. When the emotional pendulum swings back, the Russian is excessively melancholy, sullen, apathetic, and feels that he is no good.

In spite of his love of feasting and plenty, he prides himself on his manly ability to endure hardship and pain. He has a natural distaste for formality, rigid order, and adherence to time schedules. He works in spurts, which tendency may have its origin in the short Russian summer of feverish activity followed by the long period of relative indolence in winter.

On such people, the Communists are attempting to impose virtues, imported along with Marxism from Germany and other parts of the Western world. They are trying to make of them efficient, highly productive workers. Punctuality and thrift and tireless work combined with boundless and ceaseless enthusiasm are now expected of every Russian citizen. Vodka, friendliness, and even melancholy and pessimism are severely condemned.

More is expected of the leader and party member than of the common people, and it is on the leader's head that punishment falls when the people fail in what is expected of them.

A chief in industry or in the forces, Dr. Dicks reports, is required to be stern, demanding and hard-driving, always putting the general cause before consideration of the individual. Each power holder is aware that his own chief is watching him for slips or failings. There is an elaborate system of inspection, verification, and control at all levels.

Any laxity in discipline is punished. Another expected trait is the preservation of due distance between chief and subordinates; any familiarity is severely frowned upon.

Such a hard, distant master is tolerated by the people if, as usually happens, he once in a while breaks down and becomes human.

Dr. Dicks' report is part of a larger project of the Russian Research Center. His paper should not be regarded as any dogmatic exposition of the "Russian national character," Dr. Dicks warns.

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ASTRONOMY

Twin Stars Circle Each Other At 1,500,000 Miles an Hour

➤ TWIN STARS in the constellation of Cygnus, the swan, race around each other at the rate of over 1,500,000 miles an hour, Dr. Joseph A. Pearce, director of the Dominion Astrophysical Observatory, Victoria, B. C., reported to members of the American Astronomical Society and the Astronomical Society of the Pacific at a joint meeting in Victoria.

"This is the greatest value thus far discovered," Dr. Pearce stated. The stars are almost 11,500,000 miles apart. They completely circle each other in a little less than two days.

This double star team is of the ninth magnitude, thus is too faint to be seen without a telescope. Both stars are terrifically hot, their temperatures being around 60,000 degrees Fahrenheit.

Compared to our sun, the two stars are enormous. One takes up 691 times as much space as our sun, the other is 630 times as great in volume, Dr. Pearce estimates.

These stars also have much more matter in them than our sun. The mass of one is 37.3 times that of the sun, the mass of the other is 32.7 times as great. Yet the material making up these stars is relatively light. The density of each is 0.05 that of the sun, Dr. Pearce calculates.

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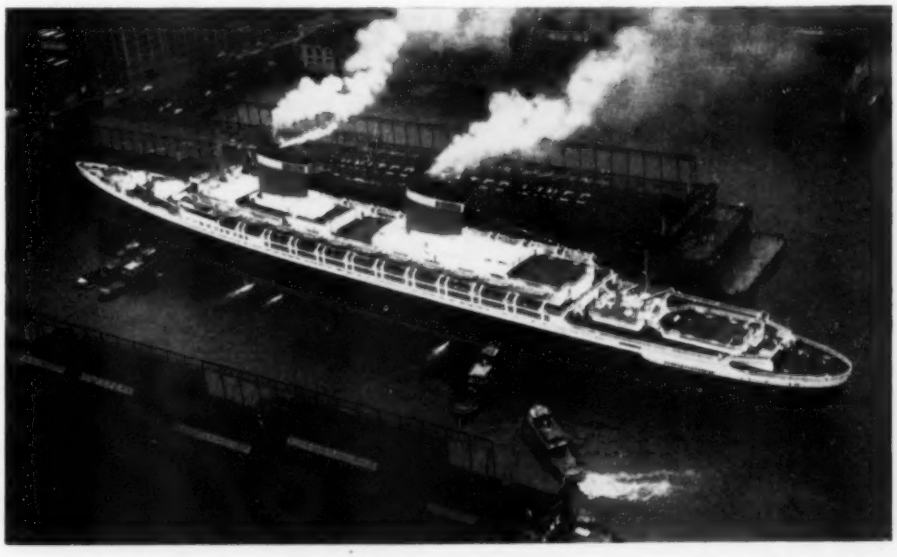

S. S. UNITED STATES—Scheduled to sail Thursday, July 3, on her first transatlantic voyage to Le Havre and Southampton is the largest ship of the U. S. merchant marine. The luxury liner grosses 53,330 tons.

ASTRONOMY

Hydrogen in Atmospheres

Lightest of all elements found in atmospheres of far-away Uranus and Neptune. Earth is only other planet yet found with hydrogen in its air.

➤ THE DISTANT planets Uranus and Neptune have just been discovered to contain in their atmospheres hydrogen, one of the atomic fuels that keep the stars burning.

Discovery of the presence of this lightest of all elements in the two planets' atmospheres was reported by Dr. G. Herzberg of the division of physics of the Canadian National Research Council, Ottawa, at the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific in Victoria, B. C.

There is little hydrogen in the earth's atmosphere and none at all has been found in the atmospheres of other planets. Now there appears to be enough in the atmospheres of Uranus and Neptune to show up in spectra of sunlight reflected from these two planets.

There are even larger amounts of helium than of hydrogen, at least three times as much in the atmospheres of both, Dr. Herzberg calculates. Helium is the next lightest element after hydrogen. There is so little helium in the earth's atmosphere that it was first discovered in the sun, then later found in our own air. A much larger percentage must exist in the gases surrounding these outer planets.

Both of these planets are so far from the sun that their atmospheres, even when heated by the sun, never get much above absolute zero. Uranus is almost 1,800,000,000 miles from the sun; Neptune is approximately 2,800,000,000 miles from it. Only Pluto is known to be more distant.

Neptune and Uranus, planets remarkably alike in size, mass, density and all other characteristics, are the first known to contain either helium or hydrogen in their atmospheres. The atmospheres of both are composed largely of methane or marsh gas. In addition, Uranus' atmosphere is known to include ammonia, ozone and sulfur dioxide.

Over three-fourths of our own atmosphere is nitrogen, over one-fifth is oxygen. The other elements are relatively rare. If there ever was much pure hydrogen, it has largely escaped into the tip top of our atmosphere or has left the earth entirely. Hydrogen has been retained mostly in combination with other elements, as with oxygen to form water.

Mars is the only other planet in our solar system believed to have an atmosphere capable of sustaining any form of life that we know. The atmosphere of Venus is rich in carbon dioxide, but lacks oxygen and water. The giant planet Jupiter and ringed Saturn contain much more methane in their atmospheres than anything else.

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MEDICINE

Doctor Paralyzes Self

➤ EXPERIMENTS IN which he produced complete paralysis in himself with a new drug are reported by Dr. Otto K. Mayrhofer of Vienna, Austria, to the BRITISH MEDICAL JOURNAL (June 21).

The drug is succinylcholine chloride, or S.C.C. for short. It is a muscle relaxing drug with very short lasting action. The paralysis Dr. Mayrhofer induced in himself with the drug lasted from about one minute to a minute and a half or two minutes, according to the dose of the drug and how it was given. The paralysis included paralysis of breathing muscles.

Object of the experiments on himself was to prove its action on skeletal muscles in man and to show that it had no undesirable side effects. It had previously been tested on frogs, cats, pigeons and dogs.

This drug and a close relative, succinylcholine iodide, or S.C.I., are new additions to the muscle relaxing drugs, such as curare compounds, flaxedil and decamethonium iodide or bromide, which are being used or tried out as aids in surgical operations and electroshock treatments.

The drug takes effect very quickly, muscles being relaxed to the point of paralysis within 35 or 40 seconds, Dr. Mayrhofer found. Recovery is also rapid. He was able to breathe normally within three minutes after the first movement of his diaphragm when the drug's effect first began wearing off.

Blood circulation was not affected even with doses several times the paralyzing dose.

Three members of his medical staff assisted Dr. Mayrhofer with the tests on himself. One gave oxygen and artificial respiration needed when Dr. Mayrhofer's breathing muscles were completely paralyzed so that he could no longer breathe himself. The second injected the drug and took pulse readings and blood pressure readings. The third took electrocardiograph readings and kept the records. Dr. Mayrhofer was completely conscious during all of the tests.

In subsequent trials on patients, anesthetics were given so that the patients were unconscious and did not know what was going on. All patients were awake at the end of the operation and none showed any side effects or after effects. The surgeons and anesthetists were "extremely pleased" and satisfied with the effects of the drug.

Good results with this drug in trials on patients are also reported by Drs. H. Richards and H. R. Youngman of the United Cambridge Hospitals. The iodide form of the drug is also being used regularly in the Karolinska Hospital at Stockholm, Sweden.

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INVENTION

Grass Seed "Blanket" For Planting Lawn

➤ NOW YOUR lawn may be planted by merely throwing a "blanket" over the lawn area. Preston F. Marshall, Washington, D. C., has patented an invention, number 2,601,620, which contemplates twisting the grass seeds into strands of yarn during the spinning and then weaving the yarn into an open mesh fabric. The fabric is then spread out on the area to be seeded. This prevents the seed from being blown or washed away or eaten by birds before germination.

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VETERINARY MEDICINE

Progress in Fight on Costly Cattle Disease

➤ "IMPORTANT" PROGRESS in the fight on brucellosis was reported to the American Veterinary Medical Association at its meeting in Atlantic City, N. J.

This disease is known also as Malta fever, undulant fever and, in cows, contagious abortion. It is said to be the nation's most costly cattle disease and besides affecting cattle, hogs and goats, can also attack humans who drink raw milk from infected animals or who handle the carcasses of infected animals.

During the past year (1951), it was reported, over 85% of all calves in six states were vaccinated. These states are Connecticut, Pennsylvania, New Jersey, Vermont, New York and West Virginia.

In addition, six other states had from 25% to 75% of their calves vaccinated. These states are Delaware, Maine, Maryland, Massachusetts, Virginia and Rhode Island.

In one state, Idaho, calfhood vaccination has increased about 100% every year from 1946 through 1950. Other states which have also pushed broad-scale calfhood vaccination include Oregon, Washington, Montana, Florida, Louisiana, Tennessee, Alabama, South and North Carolina, Georgia and Mississippi.

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AUTOMATIC SWITCHING—Both track and speed can now be remote-controlled by one operator. One button governs the route, another the speed at the Milwaukee Road's Air Line Yard, the first classification yard in railroad history to employ both automatic switching and retarding speed.

ENGINEERING

Automatic Train Assembly

➤ A LONE man in a lookout tower with a lot of pushbuttons before him is switching about 2,000 freight cars a day to proper tracks for assembly into new trains. He also controls their moving speed by use of an installation just made in a 25-track classification yard in Milwaukee.

The yard, in which incoming freight trains are broken up and the cars reassembled into new trains for various destinations, is owned by the Chicago, Milwaukee, St. Paul and Pacific Railroad. Neither automatic switching nor the use of speed-retarding devices are entirely new. But the Milwaukee installation marks the first time in railroad history, the railroad officials claim, that both automatic switching and retarder speed control have been put into service.

In modern classification yards, trains to be broken up are backed by a switch engine to a slightly elevated section of a track. At the top of the grade, cars are released one by one to roll by gravity to the proper track where new trains are being made up. Automatic switches are used to route each car to its new position.

The car's speed is controlled by so-called master retarders, which operate electrically by remote control. Each is a short section of track with side rails that may be pressed against the wheels of the car and act as brakes. The grade of the tracks after leaving the retarders is such that the cars gradually slow down to a stop.

The devices and system, designed to classify over 2,000 cars per day, are the products of Union Switch and Signal division of Westinghouse Air Brake Company. The yard, with its 25 assembly tracks, has a capacity of 1,095 cars. Some 40 to 50 trains enter or leave the yard daily.

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ASTRONOMY

Faint Comet Discovered In Ursa Minor Constellation

➤ A FAINT comet has been found in the constellation of Ursa Minor, the smaller bear.

The comet was discovered June 20 by Leslie C. Peltier of Delphos, Ohio, an amateur astronomer credited with the discovery of about a dozen comets. It has since been spotted by Henry L. Giclas of Lowell Observatory and Dr. George Van Biesbroeck of Yerkes Observatory.

The comet is of the tenth magnitude, thus a telescope will be needed to locate it in the north these summer evenings.

Word of the comet's discovery has reached Harvard College Observatory, clearing house for astronomical news in the western hemisphere.

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PHYSICS

Atomic Power Plants In Point Four Program

➤ FIRST USE of stationary atomic power plants might well be in the Point Four program.

This was suggested by Atomic Energy Commissioner T. Keith Glennan, speaking at a meeting of the American Society for Engineering Education at Dartmouth College, Hanover, N. H.

Predicting an increasing demand for stationary nuclear power plants, Mr. Glennan said: "This demand naturally will arise first where present costs for electrical energy are high and this suggests that such a program may have an important place in any future Point Four programs."

Mr. Glennan said there are only a few skeptics left in the field of mobile reactors for naval use and predicted a "firm demand" for conversion to naval propulsion under atomic power. Aircraft, however, is a job of almost unbelievable difficulty, but success there will also be achieved, he said.

Mr. Glennan pointed out that future developments in atomic energy will call for an increasing number of scientists and engineers in the coming years and he urged educators to turn out an increasing number of well-trained, well-balanced graduates in these fields.

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VETERINARY MEDICINE

Horses Go Lame on Too Little Sunlight

➤ HORSES STABLED indoors may go lame because they get so little sunlight that they get a mild form of the porous bone disease, osteoporosis, Dr. William F. Riley of Michigan State College, East Lansing, Mich., declared at the meeting of the American Veterinary Medical Association in Atlantic City, N. J.

As a help in preventing this lameness, Dr. Riley advises study of the horse's rations to make sure the animal is getting enough and the right proportions of calcium, phosphorus, vitamin D and essential trace elements.

For owners of valuable saddle and running horses, Dr. Riley advised the following four-point program of health protection for their animals: 1. proper wound treatment; 2. balanced rations; 3. regular dental care; and 4. adequate parasite control.

Horses should have their teeth examined regularly for sharp points, irregularities and sore areas, Dr. Riley explained. If dental care is neglected, the animals may have trouble in eating, leading to possible nutritional disease.

If worming is neglected, horses may become rough-coated and "poor doing," and suffer serious weight losses, he reported.

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VETERINARY MEDICINE

Farmers Face Seven Cattle Reproductive Diseases

➤ FARMERS NOW must fight seven different causes of reproductive failure in cattle, Drs. S. H. McNutt and Joseph Simon of the University of Wisconsin reported at the meeting of the American Veterinary Medical Association in Atlantic City, N. J.

The seven are: brucellosis, vibrionic infection, leptospirosis, trichomoniasis, hyperkeratosis, certain pleuropneumonia-like organisms, and possibly blood factors similar to the Rh factor.

The Wisconsin veterinarians urged careful diagnosis to distinguish between these conditions and so to make sure suitable treatment is used.

Ways by which cattlemen can help curb the present steady increase in vibrionic infection, or vibriosis, were given by Dr. S. J. Roberts of the New York State veterinary college at Ithaca as follows:

"1. In purchasing cows or bulls avoid an animal positive on the blood agglutination test for vibriosis or an animal from an infected herd, or herd suffering from infertility with symptoms suspicious of vibriosis.

"2. Aborting cows suspicious or proven to have aborted due to vibrionic infection should be isolated from the rest of the herd and not rebred for at least three months.

"3. All infected or suspicious cows should be withheld from breeding for a period of several months or be treated individually before being rebred."

Science News Letter, July 5, 1952

ENGINEERING

Engineers Experiment With House Cooling

➤ RESEARCH ENGINEERS at the University of Illinois, Champaign, are experimenting with a guinea-pig house, an old hot-air ventilating system and an undersized air cooler.

They want to help you beat the heat.

The number-one question is: Can ordinary warm-air heating ducts be used successfully to deliver cooled air in houses?

Since many American dwellings already have such ducts installed, air-cooled houses may be nearer many a layman's pocketbook than he may suppose. An air cooler would be the principal, if not the only, piece of new equipment he would have to buy.

Research engineers also want to find out what size of cooler would be required to make a house comfortable in the summer.

To get answers to their questions, University engineers turned to the Warm Air Research Residence which has 5½ miles of built-in wires that report temperatures from 274 points to a master switchboard.

An undersized cooler connected into the regular heating duct system chills the Warm Air Residence. It is considered one size too small by air conditioning standards. While persons outside the house were sweltering in 95-degree heat recently, engineers inside were taking thermometer readings of 75 degrees.

Although it is too early to draw sweeping conclusions, the University seems enthusiastic. Full details of the current research will be made public in the future, the University promises.

Science News Letter, July 5, 1952

INVENTION

Note Paper and Pencil Packaged in One Unit

➤ THE PAPER to write notes on comes right out of the pencil with which to write the notes in an invention patented by Albert H. Walter, Brooklyn, Albert N. Florence and Robert H. Lendh, New York City. The pencil, the type with replaceable leads, has a roll of paper inside, a slit where it comes out and sharp edge on the slit for tearing off the desired paper. Patent number is 2,601,650.

Science News Letter, July 5, 1952

VETERINARY MEDICINE

A-Bomb Damage to Stock Takes Weeks to Show

➤ IN THE event of atomic bombing of this country, it may be days or even weeks before we know how much damage our meat and milk animals have suffered, Maj. Chester A. Gleiser of the Army veterinary corps told the American Veterinary Medical Association meeting in Atlantic City, N. J.

Animals that come through an atomic explosion without any visible signs of injury, such as wounds or sores, may nevertheless have suffered serious internal injury.

This was learned in tests in which groups of dogs were exposed to an atomic explosion in such a manner that they received total body radiation but were protected from heat radiation, shock waves, blast effects and flying missiles.

Seven major changes were observed in the dogs. These were:

1. Immediate and progressive degeneration of the lymphatic tissues, resulting in their defective growth. The tissues later became over-developed and swollen in those dogs which recovered.

2. Early and progressive degeneration of the blood-making cells of the bone marrow.

3. Early deterioration of the lining of the intestinal and stomach walls, but with subsequent regeneration.

4. Damage to sexual organs.

5. Immediate suppression of cell-division in tissues where this activity is normally extensive.

6. Early damage to the red blood corpuscles.

7. Early damage to the membrane lining of capillaries and small arteries.

Science News Letter, July 5, 1952

IN SCIENCE

FOREST PATHOLOGY

New Disease Threatens Nation's Sweet Gum Trees

➤ A NEW forest tree disease of unknown cause threatens one of the most important hardwoods of America, sweet gum.

Now known to be present in Maryland and Virginia, the gum disease was first discovered by Dr. Paul Miller, pathologist of the U. S. Department of Agriculture's Bureau of Plant Industry, on his own land at University Park, Md. Since then it has been found in other localities.

Since sweet gum is second or third among commercial hardwoods, depending upon the annual volume of cutting, the appearance of a new disease is alarming in the same way that oak wilt now in 18 states has caused concern. The rank of hardwood in commercial use is oak, and then either gum or maple.

The first sign of the gum disease is in twigs at the top of the tree which die back. The leaves dwarf, becoming half normal size. The second year there is a bunching of leaves along the branches and then in the third or fourth year the tree dies.

Whether the new gum disease is a virus or a fungus is not yet known but U. S. Department of Agriculture research is actively under way to determine the cause and how to combat this latest forest menace.

Science News Letter, July 5, 1952

ENGINEERING

Lightning Strikes Empire State 226 Times in Decade

➤ THE EMPIRE State Building in New York, the world's tallest structure, has been hit by lightning 226 times in the past 10 years. It has drawn lightning charges from as far away as 10 miles.

Reporting to the American Institute of Electrical Engineers meeting in Minneapolis, Minn., J. H. Hagenguth and J. G. Anderson, both engineers with General Electric Co., said that despite the tremendous power of the lightning strokes, there is little danger to office workers inside the building. The giant structure acts as a lightning rod.

The longest duration of a lightning stroke recorded by oscillographs and cameras was 1.5 seconds in 1937. The length of that stroke has not been exceeded "before, since or during the studies," the engineers said.

One stroke had a current peak of 58,000 amperes. That is enough current to light over 170,000 40-watt light bulbs.

Science News Letter, July 5, 1952

NCE FIELDS

VETERINARY MEDICINE

More Milk and Butter May Come From Hormones

➤ MILK AND BUTTER may be more plentiful as a result of sex hormone treatment of sterile cows and virgin heifers. This possibility appears in the success with the method reported to the American Veterinary Medical Association meeting in Atlantic City, N. J.

Milk was produced within four months after such treatment, Dr. E. P. Reineke, J. Meites, C. F. Cairy and C. F. Huffman of Michigan State College, East Lansing, Mich., reported.

"Five cattle brought into lactation by this method produced an average of 350 pounds of butterfat in 10 months. While under hormone treatment the cattle have gained on an average of approximately 200 pounds in body weight. One of the heifers was bred and conceived on the first service during her hormone-induced lactation, though others have remained sterile," the Michigan group reported.

Progesterone and estrogen are the hormones used in the experiments to simulate the hormone changes believed to occur during normal pregnancy. The hormones were compressed into pellet form and deposited just beneath the skin of the cow's neck. Two implants at 90-day intervals were made. Approximately 30 days after the second implant, the pellet residues were removed and milking was begun.

If the new technique proves practical under field conditions thousands of sterile cows that are now sent to slaughter annually might be made to produce again at savings of millions of dollars to American dairymen, the report suggested.

Science News Letter, July 5, 1952

ENTOMOLOGY

Chemicals Repel Chiggers, Mosquitoes and Other Insects

➤ YOUR CAMPING and fishing trips, picnics or other summer outings can be freed from the misery of chiggers, mosquitoes, biting flies and many other insects if you use one of the new insect repellents developed during World War II. The following are recommended as effective against a wide range of insects:

Formula 1: Dimethyl phthalate—3 parts, Indalone—1 part, Rutgers 612—1 part. Formula 2: Dimethyl phthalate—1 part, Indalone—1 part, Rutgers 612—1 part. Formula 3: Dimethyl phthalate—3 parts, Indalone—1 part, Dimethyl carbate—1 part. In these formulas, from the U. S. Department of Agriculture Bureau of Entomology, all parts are by weight.

Some repellents now on the market under trade names contain only a small percentage of the active chemical and a large percentage of alcohol or other diluting material. They may be pleasanter to use but do not give protection for as long.

The chemicals are poisonous if taken internally but are safe to use on the skin. A few persons may get a slight rash, but the number so affected is small. Keep them away from mucous membranes, eyes, eyelids, the groin and any cut places, as they well cause smarting if put on such places.

Smear the repellent evenly over exposed surfaces of the skin and repeat when insects start biting again. These chemicals will not hurt wool or cotton cloth, but they will damage rayon, sharkskin and other synthetic cloth, finger nail polish, plastic watch crystals and articles painted, varnished or made of plastics.

Science News Letter, July 5, 1952

INVENTION

Patent Paper Parachute For Plane Package Drops

➤ A PAPER parachute has been invented by Leif Gunnar Levin Thilen, Nissafors, Sweden. It is for dropping food or other articles from an airplane. The parachute seems about like a silk or nylon chute, only made of paper. Patent number is 2,601,343.

Science News Letter, July 5, 1952

BIOLOGY

Ornate Horned Frog Eats Other Frog Species

See Front Cover

➤ THE ORNATE Horned Frog has a huge mouth in proportion to its body and the amphibian uses it mainly to gobble up frogs of other species.

Known to biologists as *Ceratophrys ornata* Bell, the frog's name is based on a peculiar modification of the upper eyelid which forms a triangular, upright but flexible, horn-like appendage. It ranges from southern Brazil to northern Argentina.

These frogs habitually bury themselves almost completely in the ground, with only the top of the head and the large mouth exposed. This makes an effective trap that opens and shuts with great rapidity on any unsuspecting small creature, mostly other species of frogs, but also small lizards and mammals.

Even the tadpoles of the Ornate Horned Frog are somewhat unusual in that they feed almost entirely on tadpoles of other frogs. The call of the frog that is shown on the cover of this week's SCIENCE NEWS LETTER is deep and hoarse.

Science News Letter, July 5, 1952

VETERINARY MEDICINE

Shots of Cud Material Life-Saving for Calves

➤ MORE VEAL, or milk, butter and beef, may result from a life-saving treatment for barnyard calves reported and demonstrated on closed circuit TV by Dr. W. D. Pounden of the Ohio Agricultural Experiment Station at the meeting of the American Veterinary Medical Association in Atlantic City, N. J.

The method consists in putting cud material from healthy cattle into the rumen, or first stomach, of the calf. The treatment should be given weekly, Dr. Pounden says.

Calves may not have normal rumen function, he pointed out, because of unsuitable feed and an insufficient amount of microorganisms to help digest the food in the rumen. This may happen when calves are penned separately and contact with older cattle is prevented.

"Failure to provide satisfactory roughage at a very early age, appears to be a serious cause of the formation of hair and fiber balls in the rumen due to the eating of straw or shavings used as bedding, and licking hair from the animal's body," Dr. Pounden stated. "Also, calves fed rations containing half as much grain as the hay being eaten developed rough coats and 'pot bellies'."

The Ohio veterinarian recommended that farmers follow a high roughage calf-raising system. This includes the use of limited amounts of milk, liberal feeding from birth of good quality alfalfa hay, plus weekly rumen inoculations with cud materials.

"Improved health" he said, "has followed the use of this plan in herds where pneumonia, diarrhea and coccidiosis were causing trouble."

Science News Letter, July 5, 1952

PHYSICS

Atomic Device Shows Radiation Damage Risk

➤ AN IONIZATION chamber which indicates damage to human tissues from a source of radioactivity was one of 40 patents recently de-classified, the Atomic Energy Commission announced.

The ionization brought about by the impingement of gamma rays and neutrons is proportional to the damage which would be produced in human tissues.

It could be used, for instance, to measure the possible effects of radioactive isotopes used in research and treatment. Or it could be used to calculate the damage from a particular source of radioctive energy, such as an atomic pile or an atomic bomb.

The inventors are J. R. Raper and R. E. Zirkle, scientists with the AEC, and they received patent number 2,596,080. It is assigned to the AEC.

Science News Letter, July 5, 1952

LANGUAGE

Practical World Language

Interlingua is a new auxiliary tongue for all the world, a natural language with regular, simplified grammar that has root words from national languages.

By WATSON DAVIS

➤ FOR CENTURIES men have dreamed of an international language whose words and sounds everyone could understand no matter what native tongue is used every day.

In the last century over 300 international languages have been invented. Some of these like Esperanto, Ido, and Occidental have enthusiastic devotees and even considerable literatures. But no world language has as yet become an international tool for communication and understanding.

A new international language is making its bow. It is not really new in the words that it uses. It is rooted in many languages of the world. The troublesome intricacies of grammar have been discarded. There is only one verb form in each tense, and nouns, adjectives and verbs don't agree as they must in some more complex languages.

Interlingua is the name of this new international language. This name has been adopted by a group of scholars who gave birth to the new language, even though in 1907 one of the earlier international languages did have the same name.

Not Overnight Creation

Interlingua is no overnight creation of one linguist or even one group of linguists. No one sat down and theorized as to what an international language should be. Instead almost three decades ago, in 1924, an ambassador-to-be, a chemist, several radio engineers, several educators, editors and linguistic experts started a long and detailed inquiry into what an international language should be.

Only now this work on an international auxiliary language has progressed from the stage of research and theory to a practical auxiliary language ready to be used to bring order into the chaos of world tongues. There are now two basic manuals, an Interlingua-English Dictionary and an Interlingua Grammar.

Interlingua is going to work in various ways. Businessmen are beginning to use it in writing their letters. Pamphlets for world distribution eliminate the need for a dozen linguistic versions by being written in Interlingua. The first periodical, named SCIENTIA INTERNATIONAL, is being issued for the first time this summer.

A scientific and educational organization, the International Auxiliary Language Association, abbreviated IALA, with headquarters in New York, has carried on the development of Interlingua and is now launching it as an addition to the world's intellectual and commercial resources.

The amazing thing about Interlingua is that the average American looking at it thinks at first glance that it is Spanish or perhaps French or Italian. It is very easy to read for anyone who knows a little of another language and even those who feel that they have neglected foreign languages find themselves understanding the gist of it at sight.

A Spanish-speaking person is likely to say, as he reads it with fluency, "What funny Spanish!" The Frenchman and the Italian will find Interlingua quite familiar. Chinese, Japanese, Arabs, and others who speak Oriental languages will find pleasing the lack of difficulties with grammar.

There is good reason why Interlingua seems so familiar to those who know something about national languages. It is developed from the consensus of three major sources of naturally international words. It uses the vocabulary of science and technology which is common to almost all the languages of the world, both East and West. It uses English roots where these are common to other languages. It has borrowed fundamentally from the Romance languages, Spanish, French, Italian, Portuguese, etc.

Millions will find the Interlingua vocabu-

INTERLINGUA USES ROOT WORDS OF MANY LANGUAGES

Interlingua	chocolate
Albanian	çokollata
Arabic	shokolata
Bulgarian, Hebrew, Russian	shokolad
Catalan	xocolata
Chinese	chu ku li / ch'iao ko li
Czech	čokláda
Danish	Chokolade
Dutch	chocolade
English, Portuguese, Spanish	chocolate
Estonian	šokolad
Finnish	suklaa
French	chocolat
German	Schokolade
Greek	sokoláta
Hawaiian	kokeleka
Hungarian	csokoládé
Irish	seocoláda
Italian	cioccolata
Lettish	šokolāde
Lithuanian	šokoladas
Norwegian	sjokolade
Persian	shukulŝ
Polish	czekolada
Rumanian	ciocolata
Serbo-Croat	čokolada
Swedish	choklad
Turkish	çukulata

Interlingua	banca
Albanian, Bulgarian, Czech, Lettish, Serbo-Croat, Turkish	banka
Arabic, Dutch, English, Hungarian, Norwegian, Polish, Russian, Swedish	bank
Catalan, Welsh	banc
Danish, German	Bank
Estonian	pank
Finnish	pankki
French	banque
Hawaiian	banako
Hebrew	banq
Hindustani	baink
Irish	bannca
Italian, Rumanian	banca
Japanese	banku
Lithuanian	bankas
Malay	bangku
Persian	bânk
Portuguese, Spanish	banco

Interlingua	capitano
Albanian	kapitani
Arabic	kabten
Bulgarian, Polish, Russian	kapitan
Catalan	capità
Chinese	chia pi tan
Czech	kapitán
Danish	Kaptain
Dutch	kapitein
English	captain
Estonian, Swedish	kapten
Finnish	kapteeni
French	capitaine
German	Kapitän
Hindustani, Turkish	kaptan
Hawaiian	kapena
Hungarian	kapitány
Irish	captaoin
Italian	capitano
Lettish	kapteinis
Lithuanian	kapitonas
Malay	kapiten
Norwegian	kaptein
Persian	kapudân
Portuguese	capitão
Rumanian	căpitan
Serbo-Croat	kapetan
Spanish	capitán

INTERLINGUA WORDS—In many cases words of this international language are common to most of the languages of the world, as shown by this comparison.

lary basically familiar to them, for it is not a new artificial language but a natural language without being a national language.

For those who feel that peace in the world will come closer if peoples talk to peoples in a language that all men understand, Interlingua has great emotional as well as intellectual appeal.

Earlier World Organization

The beginnnings of the work on Interlingua go back to an earlier world organization, the International Research Council, at whose suggestion IALA was founded. Some of those who got the research started have not lived to see the fruiting of their ideas. Among these were Dr. Frederick G. Cottrell, the chemist, Ambassador and Mrs. Dave Hennen Morris, General James G. Harbord, Radio Corporation of America, General John J. Carty of American Telephone & Telegraph Company, Dr. Stephen Duggan, Institute of International Education, Dr. John H. Finley of The New York Times, Dr. Arthur A. Hamerschlag of the Research Corporation, and Dr. Paul Monroe of Teachers College, Columbia University.

Today Interlingua has the enthusiasm of Dr. Henry Goddard Leach, president of the American Scandinavian Foundation, who is also president of the International Auxiliary Language Association. Mrs. Millicent C. McIntosh, president of Barnard College, is vice-president of IALA, which is affiliated with Barnard as the Institute of Interlinguistics.

Work on the Interlingua dictionary was begun at the University of Liverpool under Prof. William E. Collinson. Rockefeller Foundation gave a grant to the University for that purpose. IALA's international staff of linguists was dispersed during World War II and a second international staff was organized in New York under the direction of E. Clark Stillman, now director of the Belgian American Educational Foundation

Dictionary Produced

Research Corporation gave generous grants toward IALA's linguistic laboratory. Research was completed and the dictionary and grammar produced under the direction of Dr. Alexander Gode. A staff in New York, with Mrs. Mary Bray, executive director, is explaining and applying the new language to many situations, cooperatively with other organizations.

In the early stages of the use of the new language most of its use is likely to be written. In writing Interlingua the bother of complex grammar does not get in the way of expression. If you write a letter in Interlingua, you can mail it with a good chance that it will be understood by those who have never even heard of the language.

Experiments are under way in using Interlingua as the first course in languages other than one's native language. As a root it is a helpful step to national language learning.

Interlingua does not look too strange to eyes accustomed to reading English, and i reads relatively easily, as demonstrated by this excerpt:

Energia es necessari pro toto que occurre in le mundo. In tempores passate le plu. grande parte del energia applicate esseva fornite per le fortia muscular del homines e del animales domestic.

Hodie carbon, petroleo, aqua, e ligno nos da le grosso del fortia motor. Vostre musculos e mies es exempte de labor nimis dur.

Fundamentalmente tote le energia de nostre terra veni del sol. Le calor e le lumine del sol—octo minutas distante de nos in tempore de viage del radiation—es cosa vital.

Now here are the three paragraphs above in their original English.

Energy is necessary for everything that happens in the world. In olden days, most of the applied energy was furnished by the muscle and brawn of men and domesticated animals.

Today coal, oil, water, and wood give us our gross power. Your muscle and mine are spared from working too hard.

Basically all the energy of this earth of ours comes from the sun. The heat and light of the sun, eight minutes away from us measured by radiation's travel-time, is a matter of life.

Science News Letter, July 5, 1952

AERONAUTICS

Instrument-Flying Helicopter Successful at Higher Speeds

➤ RECENT TESTS of instrument-flying with a single-rotor helicopter proved satisfactory at speeds above that of minimum power but unsatisfactory at low speeds.

Lateral-direction problems were encountered at the low speeds and during precision maneuvers. Object of the tests is to increase the usefulness of the helicopter, particularly in blind and night flying.

The instrument-flying trials were made at the aeronautical laboratories of the National Advisory Committee for Aeronautics, Langley Field, Va., and results are available in an NACA report by Almer D. Crim, John P. Reeder and James B. Whitten, all of Langley.

Included in the trials were standard instruments now used on airplanes. The conclusion is that special instruments are desirable under all conditions and necessary for sustained low-speed blind flight.

With standard airplane instruments, the report states, normal blind-flying maneuvers were possible in the helicopter at speeds above 45 knots (approximately 52 miles per hour). However, close and constant attention to flight instruments was necessary. Increasing difficulty was encountered at lower speeds, and flight below 25 knots was possible only for very short periods, the scientists report.

Science News Letter, July 5, 1952

ENGINEERING

Beaten Path May Not Lead To Executive Positions

➤ ENGINEERS WHO can get off the beaten path may reach top executive positions more quickly than if they follow the well-worn trails of men who have gone before them.

"An engineer must possess many qualities to enable him to climb to the top," said C. M. Hines of the Westinghouse Air Brake Co., Wilmerding, Pa., "but certainly two of the more important qualities are creativeness and initiative."

Speaking to the American Institute of Electrical Engineers meeting in Minneapolis, Minn., Mr. Hines said the engineer must be able to find new and better ways of doing things. Furthermore, he must have the initiative to translate his ideas into action.

"Initiative," he said, "is the explosive mixture ignited by the spark of creativeness."

Engineers are preferred today for top managerial jobs, recent surveys indicate. Columbia University reports that 41% of all top management executives are engineering graduates.

A different study reveals that 92% of a large group of industrial firms "consider professionally trained engineers as potential general management executives."

Science News Letter, July 5, 1952

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MAMMALOGY

Rare Seals Reside In San Diego Zoo

➤ THE ONLY two Northern Elephant Seals believed in captivity are now in residence at the San Diego Zoo. These two seal pups were captured on Guadalupe Island, Mexico, and are the first specimens to be imported before World War II.

When they reach adulthood, the pups may be as long as 22 feet and weigh as much as four tons.

One of two species of Elephant Seal, the Northern form is found only on the islands off Baja California, Mexico, and southern California. At the turn of the century, the species was near extinction.

In the mid-1800's, whalers had slaughtered great numbers of Elephant Seal for their oil as a substitute for whale oil which was scarce. Now, there is rigid protection of the Elephant Seal; its numbers are increasing and the animals have reappeared in many areas.

The other species of Elephant Seal occurs in the Antarctic.

Science News Letter, July 5, 1952

INVENTION

New Gun Sight Patented By Aircraft Carrier Expert

➤ REAR ADMIRAL Daniel V. Gallery, Jr., commander of the Hunter-Killer Force of the Atlantic Fleet, has been granted a patent by the government on a new gun sight.

Admiral Gallery, who is an author as well as an inventor and an expert in aircraft carrier operations, received his patent for a gun sight to be used with aircraft machine guns. He made application for the patent 11 years ago. The time interval probably means that the device has been kept secret until now.

The Admiral has introduced a correction into one of the two sighting elements on an aircraft machine gun which compensates for the effect of the plane's speed on the initial velocity and trajectory of the bullet. Patent number is 2,600,400.

Science News Letter, July 5, 1952

VETERINARY MEDICINE

Mink Coats Threatened By Anthrax Outbreak

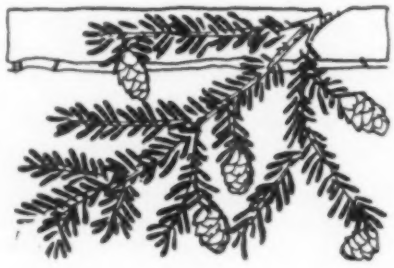
➤ MINK COATS will be scarcer unless mink breeders are careful to avoid feeding their animals meat from animals that have died of anthrax, the American Veterinary Medical Association warned in Atlantic City.

Anthrax-infected beef was found the cause of three out of four anthrax outbreaks on mink ranches in Wisconsin during the past year. The fourth was suspected to have come from infected pork livers.

Science News Letter, July 5, 1952

BOTANY

NATURE RAMBLINGS



Evergreens

➤ EVERGREENS INCLUDE many plants besides the needle-leaved conifers. All palms and cycads, many ferns, most magnolias, bays and laurels, the Christmas hollies, arid-land succulents as diverse as century plants, yuccas and aloes—all these and many more are evergreens.

An evergreen is a plant that retains its foliage during seasons when food manufacture and growth are suspended, whether it be during winter storms or summer droughts.

Staying green all the time has its advantages. It enables the plants to get into action immediately upon the return of favorable weather, without having to wait to unfold and expand leaves that have been stored in buds or hidden underground. This is particularly helpful in the far north and at high altitudes, where the growing season is short, and also in deserts, where rains may be brief and unpredictably irregular in their occurrence.

But there are drawbacks to evergreenness, too. Because of the great expanse of surface which leaves have to present to the sun in order to carry on their food-manufacturing business, leaves are great evaporators. And when water is lacking, as in the desert, or frozen into unavailability, as in the arctic and temperate zone winters, evergreen leaves are under really critical stress.

Apparently in response to these recurring water crises, a number of interesting water-saving devices have been developed in evergreen leaves. Their surfaces are sometimes greatly reduced, as in conifer needles and the "mouse-ear" leaves of some desert plants; they may have thick, waxy or horny skins, as on holly and magnolia leaves; there are often hairy, scaly or light-reflecting coverings that protect against excessive sunshine; the microscopic stomata or "breathing-pores" frequently are sunk in pits or grooves.

As an extreme development, leaves may be omitted altogether and the green food-making surface confined to modified stems, as in cacti and similar succulents, or in such "switch-plants" as Australia's casuarina tree and the ephedras of China and our own Great Basin area.

There are also internal protections against excessive evaporation. These usually take the form of a concentrated or thickened sap, containing high percentages of mucilage-like polysaccharides or sometimes of mineral salts. As is well known, it is easy to evaporate water out of a very thin syrup, but as the syrup becomes thicker, evaporation becomes slower and slower. The sap of some evergreen plants seems to work on the same principle, saving at least the minimum of water necessary for survival.

Science News Letter, July 5, 1952

ENGINEERING

Free Lines from Sleet

➤ GRACEFUL POWER lines that sometimes span whole valleys can be de-iced during sleet storms by calculated overloads or short circuits, the American Institute of Electrical Engineers meeting in Minneapolis, Minn., was told.

Ice-covered lines, though beautiful to the layman, can be headaches to power companies. Sometimes the cables snap under the heavy ice load and slither along the ground like snakes, spitting fire as they go until a circuit breaker cuts off the power.

To melt the sleet as it forms around the lines, heavy electrical loads are applied which cause so much current to flow that the conductors become heated. The ice then melts and drops to the ground.

When sleet conditions prevail, careful check is kept with the U. S. Weather Bureau and with observers along the transmission line. Radio and carrier-current devices are used to communicate information from point to point of a company's system.

Occasionally sleet-covered wires fanned by the wind begin to swing violently, sometimes crackling against each other in a flash of fire. More rarely, the lines start swinging up and down instead of from side to side, vastly damaging the transmission facilities. That condition is referred to as "galloping conductors." It has filled many a power company employee with awe.

De-icing techniques used by electric utilities in New York State, northern Illinois, Indiana, Ohio, Kentucky, West Virginia, Tennessee, Pennsylvania and New England were reviewed in the technical reports presented at the meeting.

Although much progress has been made in the past 40 years in reducing ice-caused damage, many problems remain.

Science News Letter, July 5, 1952

ASTRONOMY

Many Eclipsing Stars

A total of 42 eclipsing stars beyond our own galaxy have been spotted. They are among the brightest two-star systems ever found in the universe.

➤ DOZENS OF eclipsing stars so bright we here on earth can see them even though they are beyond our own Milky Way galaxy of stars, and some 500 million billion miles away, have been detected in the southern skies.

A total of 42 eclipsing stars have been spotted in the Small and Large Clouds of Magellan, the closest galaxies to our own, Mrs. Virginia McKibben Nail of Harvard College Observatory reported to members of the American Astronomical Society and the Astronomical Society of the Pacific meeting in Victoria, B. C. Except for these, only two stars beyond our own galaxy are known to be double stars that periodically eclipse each other.

"These stars are among the brightest two star systems ever to be found in the universe," Mrs. Nail stated. "Eclipsing stars brighter than these may never be found."

The newly-discovered eclipsing stars are each about 600 times as bright as our sun Although on photographic plates they show up as about the 15th magnitude, if they were as close as Sirius, the brightest star in the sky, they would outshine it and all other stars in our heavens.

The stars in these two-star teams usually take two or three days to swing around each other. Some, however, take as little as a day while one team requires over two months to complete its circuit.

Although the individual stars in the pairs have never been seen, Mrs. Nail estimates that the stars of each pair are about the same size. Many are quite elliptical in shape rather than being as nearly round as our sun or earth or moon. Most of them are blue in color.

The orbits of most of the doubles are so oriented that the most distant member is never completely hidden. The eclipse is only partial and the change in brightness is not very great.

The groups of hundreds of millions of stars that make up the Large and Small Magellanic Clouds are so far south that they are never seen from the United States. To the unaided eye they look like detached portions of the Milky Way. To study the change of light for each pair, Mrs. Nail used photographs made throughout the past ten years at Harvard's station in the Orange Free State, South Africa.

At first these eclipsing stars were believed to be members of our own Milky Way galaxy, seen against a background of Magellanic cloud stars. But further analysis proved them to belong to these more distant galaxies and to be uniformly distributed throughout them.

Science News Letter, July 5, 1952

VETERINARY MEDICINE

National Anti-Rabies Effort

➤ A NATIONAL program to control and eventually wipe out rabies from this country was called for, as the so-called dog days and, according to the old notion, mad dog season approaches.

The United States has more rabies than probably any other country in the world, Dr. H. W. Schoening of the U. S. Bureau of Animal Industry declared at the meeting of the American Veterinary Medical Association in Atlantic City, N. J.

"The time is now past due for a national program of control and eventual eradication," he said.

"This envisages the U. S. Public Health Service, the U. S. Fish and Wildlife Service, the U. S. Bureau of Animal Industry, the State Livestock Sanitary Service, the practicing veterinarians, physicians and the public at large working together," he said.

Evidence that such a program would work came from a report by Dr. Robert McClelland, Buffalo, N. Y., veterinarian, of how a coordinated control program checked rabies in that city when a severe outbreak flared up after World War II.

"The county rabies committee sparked local bodies into action," he said. "Health departments, police and sheriff's departments, dog clubs, civic clubs and veterinarians joined in the effort. Public response to such a careful educational program was amazing.

"Within a year, the incidence of rabies was reduced to zero."

As a member of an anti-rabies team, Dr. McClelland said, the practicing veterinarian has three duties to perform:

1. Careful clinical diagnosis. 2. Protection of his patients through immunization. 3. Education of his clients with emphasis on the control of hysteria.

Science News Letter, July 5, 1952

● RADIO

Saturday, July 12, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Harry J. Prebluda, biochemist of the U. S. Industrial Chemicals Company, discusses "Chemical Aids to Growth."

ENGINEERING

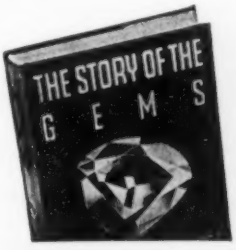
Midwest Oil Pipe-line Operated From New York

➤ A MIDWEST oil pipe-line has been operated by remote control from New York City for almost two years, A. J. Hornfeck and G. R. Markow of the Bailey Meter Co., Cleveland, Ohio, reported to the American Institute of Electrical Engineers in Minneapolis, Minn.

Through remote metering and teletype facilities, the New York operator has a complete picture of, and full control over, the eight-inch pipe-line which connects the Wood River Refinery of the Shell Oil Co., in southwestern Illinois, to Columbus, Ohio, several hundred miles away.

Four automatic pumping stations give the refinery products an extra boost as they speed toward Cleveland. In an emergency, the New York operator can sound a siren in each of the pumping stations to alert the local operator on duty to the emergency condition.

Science News Letter, July 5, 1952



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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANGLO-AMERICAN RELATIONS IN THE ATOMIC AGE—James B. Conant—*Oxford University Press*, 42 p., $1.00. This lecture, delivered at the London School of Economics and Political Science, makes suggestions for building better understanding through closer cooperation in atomic research.

CAPACITIES OF PLUMBING STACKS IN BUILDINGS—Robert S. Wyly and Herbert N. Eaton—*Govt. Printing Office*, Bu. of Standards Building Materials and Structures Report 132, 28 p., illus., paper, 20 cents.

THE CORROSION RESISTANCE OF TIN AND TIN ALLOYS—S. C. Britton—*Tin Research Institute*, 77 p., paper, approx. 50 cents. Official report of an international institute financed by tin producers in the Belgian Congo, Bolivia, Indo-China, Indonesia, Malaya and Nigeria.

FUNCTIONAL ANATOMY OF THE MAMMAL: A Guide to the Dissection of the Cat and an Introduction to the Structural and Functional Relationship Between the Cat and Man—W. James Leach—*McGraw-Hill*, 2d ed., 276 p., illus., $4.50. For students beginning work in anatomy. Emphasis is placed on the similarities and differences between cat and man.

HARWELL: The British Atomic Energy Research Establishment 1946-1951—*Her Majesty's Stationery Office*, 128 p., illus., paper, approx. 84 cents. Official report of what the British are doing in atomic research. A useful glossary and reading list are included.

A NEW MANUAL FOR THE BIOLOGY LABORATORY—Bernal R. Weimer and Earl L. Core—*Wiley*, 2d ed., 333 p., illus., paper, $3.50. The student is urged to approach his laboratory studies with the vigorously curious mind of the investigator and to cultivate an open and tolerant mind.

OPPORTUNITIES FOR ALL—Richardson Wood and Company—*Technical Cooperation Administration*, 62 p., illus., paper, free upon request to publisher or publication department, U. S. Department of State, Washington 25, D. C. A book of charts and photographs showing the investor graphically how he can invest his money to help other peoples make a world of peace and opportunity.

PATTERN DESIGN—Henry E. Kiley and John H. Paustian—*International Textbook Co.*, 2d ed., 193 p., illus., $4.75. A practical book for the man who makes patterns for molding metal articles.

THE RATIONAL AND THE SUPERRATIONAL: Studies in Thinking—Cassius Jackson Keyser—*Scripta Mathematica*, 259 p., illus., $4.25. A series of philosophical essays discussing some of the relations of science and religion and other problems.

SURVEYOR'S FIELD-NOTE FORMS—Clarence E. Bardsley and Ernest W. Carlton—*International Textbook Company*, 3d ed., 120 p., illus., $3.00. Field notes, according to the authors, should not be kept on scraps of paper; they should be neat, legible, and systematic enough to qualify in court if necessary. This book shows you how.

Science News Letter, July 5, 1952

NUTRITION

Spice That Salt-Free Diet

➤ THOUSANDS OF persons with high blood pressure and heart disease have been put on a salt-free or low sodium diet by their doctors.

To many of them, especially at first, food tastes flat and there is no fun in eating. Others may put up with the diet for a time, till the monotony of it drives them to cheat a little.

The salt-free diet can be made tasty by the judicious use of spices. That this can be done safely is shown by studies reported by Dr. C. A. Elvehjem and C. H. Burns of the University of Wisconsin to the American Medical Association. They analyzed 100 samples of commercial spices for their salt, or sodium, content.

Out of 41 different spices only five were found to have concentrations of more than 0.1% sodium. And of these, only dried parsley and celery flakes contained enough salt to warrant ruling them out of low-sodium diets, according to the chemists. Many of the spices had between 0.01% and 0.02% concentrations of sodium and most showed less than 0.05%.

"These figures indicate," say the authors, "that with the exception of celery flakes and parsley flakes, the amount of sodium contributed through the usual amount of spices used is insignificant, and that most spices can be used safely in low-sodium diets."

For the tests the chemists used samples of natural spices sent to them in regular commercial packages from several different manufacturers. Each sample was analyzed at least two times by means of a flame photometer.

Where the chemists received samples of the same spice from different companies they analyzed each separately. They reported "remarkably good correlation," between the products of different sources.

The list of spices examined ranged from ground allspice to vanilla beans and included anise seed, bay leaves, caraway seed, dill seed, garlic powder, ginger, oregano, pepper, poppy seed, sage and thyme.

Science News Letter, July 5, 1952

ENGINEERING

Italy Turns to Gas For Electrical Power

➤ ITALY SOON may have to turn to gas as a source of power to drive giant electric generators, Piero Ferrerio, president of the Edison Company of Milan, reported to the American Society of Mechanical Engineers meeting in Cincinnati.

Currently, water power largely is used to turn the generators. But Mr. Ferrerio said two-thirds of Italy's existing water sources which are suitable for use in electric power generation will have been exploited in about one more year.

However, he said: "At present, all activity in the natural gas field is practically concentrated under a Government monopoly, which among other things seems to follow a discriminative policy between consumers and a price policy certainly not encouraging increased consumption."

He said legislation was needed that would throw open Italy's gas reserves to all organizations capable of undertaking prospecting and utilization activity. The legislation should combine the interest of the general public and of the organizations.

Science News Letter, July 5, 1952

ASTRONOMY

Curious Stars Are New-Born Or Trapped in Gas Clouds

➤ SCATTERED THROUGHOUT our galaxy are curious variable stars embedded in great clouds of dust and gas. Some of these clouds are dark, others are lit up by a nearby star. The more astronomers study these stars, the more abnormal they prove to be.

These stars, named T. Tauri stars after recently formed by condensation out of the dust and gas of the nebulae, or they are stars that have, in their motion through space, accidentally plunged into the nebulae, Dr. George H. Herbig of Lick Observatory stated at the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific in Victoria, B. C.

If the stars are new, all of the stars in the cluster must have been formed out of the nebulae rather recently, astronomically speaking, Dr. Herbig reported. If they are old stars trapped by clouds of dust and gas, they were abnormal before they ran into the cloud, he concludes.

These stars, named T. Tauri stars after one of the best-known of their kind, brighten and fade in a most irregular and erratic manner. When their light is spread out into its rainbow colors, it indicates large quantities of the curious combination of hydrogen, helium, calcium and iron in the star. If their presence in the nebulae is an accident, their encounter with the clouds of gas and dust must have upset them, giving them peculiar spectra and variation in light.

Science News Letter, July 5, 1952

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 629. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *REVERSIBLE RAINCOAT for women is made of a vinyl plastic finished to resemble somewhat a soft taffeta of gay, plain-color combinations, and of pin-dot patterns. The seams of the coat are electronically sealed, and snaps substitute for buttons.*

Science News Letter, July 5, 1952

⚙ *PORTABLE GRILL is about the size of a brief-case when folded, but has over two square feet of cooking space when open. Weighing only nine pounds, the grill burns either charcoal or wood and has three cooking levels which permit coffee to be made while meat is being prepared.*

Science News Letter, July 5, 1952

⚙ *OIL-FIELD OUTFIT is a technically accurate, educational model kit for children in grade school to build. When assembled, it graphically illustrates with model derrick, airplane, trucks and little men how the petroleum industry explores and drills for oil.*

Science News Letter, July 5, 1952

⚙ *DRAPERY TAPE and hooks make straight-hanging, pleated drapes easier to achieve, as shown in the photograph. Sewn right to the drape, the tape has pockets spaced evenly along its length. When the drapery material is gathered so that the pockets fit over prongs of the drapery hooks, the drapes become pleated automatically.*

Science News Letter, July 5, 1952

⚙ *POURING SPOUT made of special acid-resisting rubber and plastic tubing fits any size carboy and permits acid to be poured from the bottle in an even, splashless stream without removing the stopper.*

Science News Letter, July 5, 1952

⚙ *HEATING SYSTEM for homes blows hot air into rooms through a decorative, circular vent in the ceiling. Cooled-off air is drawn from the rooms through grilles in the baseboard and is circulated to the furnace for reheating. In the summer, the ventilating system can be used to distribute cooled air through the house if an air-conditioning unit is attached to it.*

Science News Letter, July 5, 1952

⚙ *HEATING TAPES, designed to be wound around tubes, pipes and odd-shaped vessels in the laboratory, are regulated by a small variable transformer. Consisting of electrically heated resistance wire, the tapes are capable of maintaining temperatures of 400 degrees Centigrade in glass tubes having walls two millimeters thick.*

Science News Letter, July 5, 1952

⚙ *TRAFFIC LIGHT, designed to be seen easily even if the sun is shining directly on its face, combines high signal brilliancy with long light bulb life, thus reducing maintenance costs as well as traffic tie-ups.*

Science News Letter, July 5, 1952

ASTRONOMY

Gas Cloud Structure

➤ NOVA AQUILAE, an exploding star in the constellation of Aquila, the eagle, in 1918 had such a violent outburst that it temporarily became one of the brightest stars in the heavens. Within four days its light increased 40,000 times. Astronomers are still discovering what the star is like.

"It is at the secondary minimum of brightness as this puzzling star faded that we can learn most about how its erupted gases are distributed," Dr. Dean B. McLaughlin of the University of Michigan's Observatory told members of the American Astronomical Society and the Astronomical Society of the Pacific meeting in Victoria, B. C.

Expanding rings of gaseous clouds around the star's equator and thick knots of gases moving outward from its poles distinguish this star, Dr. Walter Baade of Mt. Wilson and Palomar Observatories believes. Dr. McLaughlin believes that only at secondary minimum light were all these details revealed in the star's spectrum or prismatic light pattern.

Nova Aquilae, in 1918 brighter than all stars in the heavens except Sirius and of negative one magnitude, is now of the 11th magnitude and not visible with the naked eye or binoculars. These July evenings it is in the southeast.

"By the time the star's light had fallen to minimum, all of the opaque matter surrounding the star had cleared away and the small, hot star in the center showed up," Dr. McLaughlin pointed out.

This bright central star at minimum excited all the gases in the principal shell surrounding the star. Even the thick knots of material ejected at the star's poles when it first exploded shine at this time, he reasons.

When the star brightened again, however, its light excited chiefly knots of gas located inside the main part of the shell and illuminated only the inner surface of the large polar gas knots. A cloud of the newly ejected gases surrounding the star and closer to it than most of the gases screened out most of the high-frequency radiation which would have made the outer gases shine. Even the little radiation that did get through was just able to penetrate the thinner parts of the star's gaseous shell and cause them to glow.

At maximum, Dr. McLaughlin figures, we here on earth saw light that originated from clouds of gases surrounding the star and from the inner sides of the polar knots of gases. The ring or knots inside the main shell shone to full advantage and stood out above all else.

Science News Letter, July 5, 1952

Do You Know?

If a fox or raccoon fails to run when you approach it, the animal may have *rabies;* if it scratches or bites you, see a doctor at once.

To drive a *golf* ball about 250 yards, the head of the club must move at a speed of about 175 feet a second, or about 120 miles an hour.

The nutria, an *animal* introduced from Brazil resembling a large muskrat or woodchuck, has greatly multiplied after its escape from captivity and now is the most abudant animal in a large section of the southwest Louisiana marshes.

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VOL. 1 NO. 1 — JULIO 1952

SCIENTIA INTERNATIONAL

EDITION IN INTERLINGUA DE SCIENCE NEWS LETTER

*** Ecce le prime numero del prime anno del periodico Scientia international. Illo es un chronica de factos e eventos de interesse currente ex omne partes e sub-partes del scientias natural e se adressa al scientistas e al amicos del scientias in omne partes del mundo. Illo se distingue de multe publicationes de character comparabile per le absentia in su columnas de omne genere de specialisationes. Illo parla de atomes e aeroplanos, de metallurgia e medicina. Illo non se restringe a servir specialistes de iste o ille disciplina; illo cerca interessar expertos ex numerose campos de specialisation, non solmente in ler propri problemas sed etiam in le problemas del disciplinas vicin in que illos es laicos como le resto del humanitate. In iste sensu Scientia international es un publication general pro expertos e simultaneamente un periodico specialisate pro lectores laic.

*** Sed tote isto non indica le character unic de Scientia international. Il existe in varie paises numerose publicationes non plus restringite in lor scala de interesses que illo. Omnes, nonobstante, remane limitate in lor utilitate per le limites del lingua in que illes es redigite. Scientia international non cognosce tal limites. Redigite in Interlingua illo es immediatamente comprensibile pro lectores del plus variate ambientes linguistic. Le internationalismo de interlingua devenit un symbolo del internationalismo del spirito scientific. Lectores francese comprende Scientia international proquanto illes parla fr-rocese; lectores italian lo comprende proque illes parla italiano ...; e scientistes e amicos del scientias in omne partes del mundo comprende Scientia international proque illes parla le lingua del scientias que es un lingua international.

*** Le scientias que es international requira un libere fluxo de informationes al quatro angulos del mundo. In isto, Scientia international pote assister los. Scribite in lingua international, illo non cognosce limites linguistic, como le spirito del scientias non cognosce limites de racia o de nationalitate.

*** Ben que le functiones practic de un periodico como Scientia international es frappantemente clar, le difficultates a superar pro avantiar le interprisa usque al apparition del prime numero non esseva negligibile. Pro succeder multo minus esseva requirite que le intime cooperation de duo organisationes representantes distinguite del reportage scientific de un latere e del altere del practica interlinguistic.

*** Le realisation de tal cooperation -- evidentiate per Scientia international nunc realitate inter le mente de un lectores -- es le merito de Watson Davis de Washington. Membro del consilio directival de IALA (International Auxiliary Language Association) e simultaneamente director de Science Service, le ben-cognoscite instituto dedicate al propagation de informationes scientific, senior Davis esseva le primo a comprender le possibilitates constructive de combinar le resources del duo mentionate organisationes. Le resultato es Scientia international, redigite per IALA e publicate per Science Service. A.G.

Ingenieria *** Un diesel monocylindric a duo pistones le quales se lanceate al extremitates del cylindro per explosiones al centro e reveni sub le pression de aere comprimite es un del productos de recercas conducite al universitate Stanford sub contractos con la marina statounitese. Ille age como pompa pneumatic transmittente su energia sub forma de aere comprimite. Le expansion in direction opposite reduce le vibration del machina a un minimo, e le absentia de bielles elimina tote pression lateral del pistones. Un simile motor esseva usate con ben successo pro apparatures auxiliar in submarinos german. Le marina statounitese intende usar lo in parve naves e camiones. (3207196?/39)

*** Le action de un campo magnetic pote pumpar metalles in stato liquide e cargate de electricitate tirante un systema de tubos tote sin uso de machineria a parties movente. Le idea non es nove. Concipite originalmente in 1907, illo esseva in 1928 le objecto de un patente de Albert Einstein. Nunc pro le prime vice le pompa electromagnetic es in uso practic pro pumpar metalles a temperaturas usque a 400° C. esse functiona como refrigerantes in reactores atomic. (1307196?/19)

Metallurgia *** Patentes recente protege le productiones de alligates de titanium e aluminium con antimonio, bismuth, boro, indium, chrome, e molybdenum. Le peso de titanium pur es medie le peso de aciero, sed su fortia es duo vices ille de multe formas de aciero. In forma de alligates, titanium pote reduplicar su fortia. Le nove alligates pe-

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